

Manual

Software Version 3.0

By Steven Peterson

And

Robert Blackwell

Digi-View software by Tim Jenison

Digi-View Gold hardware designed by Tim Jenison

Digi-View software version 3.0 by Kevin Rouviere

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FORWARD BY Tim Jenison

With the introduction of Digi-View 3.0, NewTek has achieved the goal we set over two years ago: to deliver the ultimate low cost image capture system for the Amiga. There are Digi-View owners in every nation of the world. You can imagine the many calls and letters we have received asking for new features and improvements. With Digi-View 3.0 we answer those requests by adding the features most asked for including, Overscan, Halfbrite, and a special line art mode to name a few.

Digi-View 3.0 is powerful because of the Amiga. After two years on the market, the Amiga remains the best price/performance graphics computer available. This is no small accomplishment in this day of ever changing technology and with more computers being introduced now than at any other time in history. It's clear that the Amiga is something special.

The Amiga remains superior to other computers only because of its original design team's vision and unwillingness to compromise. Their focus gave NewTek the chance to create products like Digi-View Gold and Digi-Paint, for the first time in history giving end users the tools that have long been available only to the professionals—and without spending \$20,000.

I would like to thank Robert Blackwell and Steve Peterson for working on the manual and the staff at NewTek for working 60 hour weeks. And to all of you Digi-View owners who have contributed to the growth of NewTek. We will continue to push the envelope and deliver breakthrough products that can be done only on the Amiga.

Tim Jenison
President, NewTek, Inc.
May 1988

Introduction

What is Digi-View Gold? Digi-View Gold is a combination of hardware and software that enables you to transfer very high quality color or monochrome images from a video camera to your Amiga computer. You can use Digi-View Gold to manipulate such images in a variety of ways. Once you have the image the way you like, it can be stored on disk, transferred to other programs, or even sent around the world to another Amiga using a modem.

Color images are captured using a color separation process which produces near photographic quality images on your Amiga screen. A color filter wheel (included with Digi-View Gold) is mounted in front of the video camera lens. Three pictures are taken, one through each of the red, green, and blue filters, during which time the subject must be stationary. The Digi-View 3.0 software then combines the separate color images into a lifelike, full color display in any of the Amiga's screen resolution modes.

Digi-View Gold is a powerful, easy to use system for bringing video images into your Amiga for a variety of applications. Digi-View Gold's image capture and processing capabilities make it an essential part of a complete Amiga graphics system. This manual will tell you how to set up your Digi-View Gold system, take you through some tutorials, and give you thorough information about the tools included in Digi-View Gold.

We hope you'll get a lot of use from your Digi-View Gold. Please write to us at NewTek and tell us what you're doing with Digi-View Gold; we'd like to hear from you—feedback from our users helps us to create better products.

How To Use This Manual

If you are totally unfamiliar with the Amiga, we recommend that you read the Amiga User's Manual before using Digi-View Gold. If you're familiar with the Amiga, you should find Digi-View Gold quite easy to use. Generally, this manual assumes some familiarity with computers and the Amiga in particular.

If you're like most users, you want to get started right away. Read through the Getting Started section to find out how to install the Digi-View Gold hardware and software.

Once you've done that, read the Digitizing Tips in the Using Digi-View Gold section to help you get better quality images. Most of the controls in Digi-View Gold have obvious functions, so some experimentation will show you how they work.

If you want to approach Digi-View Gold more systematically, the manual is arranged so that you can work through it for a complete course in Digi-View Gold. The tutorial will guide you through the digitizing process, showing you the powerful features available in Digi-View Gold so you can achieve the best possible results.

Getting Started

Equipment Included

Your Digi-View Gold system consists of the following items:

- Digi-View Gold hardware (the small black unit)
- Color filter wheel (divided into clear, red, green and blue quarters)
- Color filter mounting bracket
- Digi-View 3.0 software on one (1) 3.5" disk
- Digi-View 3.0 manual
- Warranty card



Other equipment that you'll need:

- Amiga 500, 1000 or 2000 computer with at least 512K of memory and 1 disk drive
- Video camera (black & white recommended, but a color camera or camcorder may be used)
- Fluorescent Lighting (you may use incandescent lighting with a color camera, but fluorescent is better)
- Coaxial video cable (for connecting Digi-View Gold to the video camera; the cable must have an RCA jack for connecting to Digi-View Gold)
- Standard F/F RS-232 gender changer (for Amiga 1000 only)

Recommended Equipment

The following equipment is not necessary to use Digi-View Gold but would make digitizing easier, faster or better:

- Digi-Droid (motorized filter wheel for Digi-View Gold)
- Copy stand for your video camera (NewTek sells the CS-1L; see appendix A)
- Base-Band Distribution Amp (so you can have Digi-View Gold and the monitor plugged into the camera at the same time)

Hardware Installation

When you have all of the equipment ready, make sure that the power is off to your Amiga and to your video camera and then plug the Digi-View Gold unit into the parallel port. If you have a printer hooked up to your Amiga, it's probably plugged into this port, so you will either need to unplug it or use an RS-232 serial switchbox to hook both up at the same time. (NOTE: You must use a Female/Female RS-232 gender changer between the parallel port and Digi-View Gold if you have an Amiga 1000). After Digi-View Gold is properly installed on the parallel port, plug one end of a coaxial video cable into the "Video In" jack on the Digi-View Gold unit, and plug the other end of the cable into the "output" jack on the video camera (you may need an adapter if the camera has a BNC jack instead of an RCA jack). The Digi-View Gold unit uses a standard RCA jack, as do most consumer cameras. Appropriate cables and adapters may be found at an electronics supply store, such as Radio Shack. Make sure you use video cable, not audio cable. Although the RCA jacks are the same on both cables, the video cable is made with 75-ohm coaxial cable, which is necessary for good video resolution.

Attach the color filter wheel to the video camera using the mounting bracket supplied. Most cameras have screw holes in the casing for a tripod mount, which you can use for the mounting bracket. Depending on the camera you're using, you may have to be more innovative in how you attach the mounting bracket—perhaps using tape or velcro. In any case, make sure that the color filter wheel is mounted such that the red, green, and blue filters can be positioned fully in front of the camera lens. Use the hole in the bracket that puts the filter as close as possible to the camera lens without actually touching the lens. Make sure the filter is clean by wiping it with a soft cotton cloth.

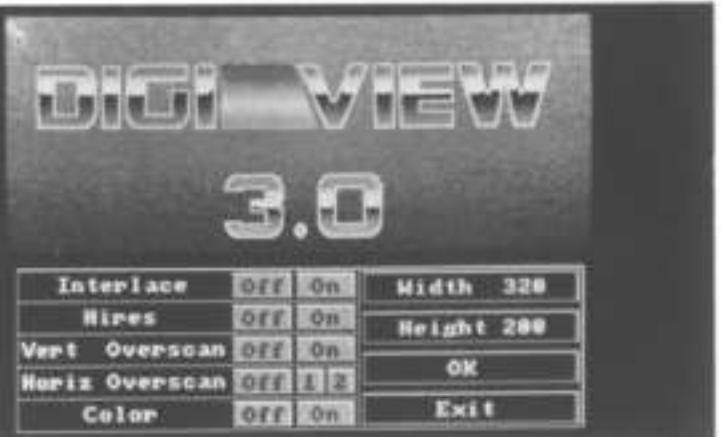
Digi-Droid Set-up

If you have a Digi-Droid motorized filter wheel, follow the directions included with Digi-Droid to set up your system. Use the Digi-Droid filter wheel instead of the filter wheel provided with Digi-View Gold. The Digi-Droid plugs into the second mouse port on your Amiga, and Digi-View's software recognizes the presence of Digi-Droid. When your Digi-Droid is plugged in and you start up the Digi-View Gold software, Digi-View Gold will use the Digi-Droid to automatically turn the filter wheel when you digitize, making the digitizing process fast, easy and automatic. More information on Digi-Droid is in the Reference section under the Digitize and Controls menus.

Software Installation

Turn on your Amiga and insert the Digi-View Gold disk when the picture of the workbench disk appears on the screen (if you have an Amiga 1000, first insert the Kickstart disk in the internal drive). When the screen shows a picture of the Workbench disk, then insert the Digi-View Gold disk. When the Workbench screen appears, point to the Digi-View Gold disk icon and double click the left mouse button. Digi-View Gold will then load into your Amiga.

Once this is done, you will see the Digi-View 3.0 title screen, which will allow you to select the resolution that you want to digitize in (see photo). There are two ways to select a resolution:



by clicking on one of the gray (orange when selected) "on" or "off" boxes in the middle of the screen, or by clicking in the "height" and "width" boxes on the right. Continuous clicking with the left mouse button in one of these boxes cycles through all of the resolution modes available in that dimension, simply stop when you see the resolution you want. There are 2 levels of horizontal overscan available in Digi-View 3.0 which are accessed by clicking on either "1" or "2" instead of "on". The "Color" option is set "on" in default and can only be unselected by clicking in the "off" box next to it.

When you have the resolution that you want, click inside the "Ok" box to get into Digi-View 3.0. If you want to quit the program at this point, click in the "Exit" box to get back to the Workbench screen.

You should make a back-up copy of Digi-View 3.0 at once (Digi-View 3.0 is NOT copy protected), in case your disk is damaged during use. Pull down the Project menu by holding down the right mouse button, then move the pointer to Project. Still holding down the right mouse button, move the pointer down to Quit, then release the button. You will be returned to the Workbench, where you should make a copy of your Digi-View Gold disk. (The procedure is outlined in Appendix D). From now on, always use a copy of Digi-View Gold instead of the original. Store the original in a safe place away from your computer.

Menus

This reference section describes each feature of Digi-View Gold, addressing each menu item and its use. We recommend that you get an overall grasp of the program by working through the Tutorial; then the Menus section will serve to supplement the information you've learned from the Tutorial.

General Notes

There are three menus in Digi-View: Project, Digitize and Controls. All menus are activated by holding down the right mouse button, moving the pointer to the top of the screen and pointing at the menu you want, then moving the pointer down until the menu item you want is highlighted. Then release the button, and that menu item will be activated. This process is called "pulling down a menu."

Whenever the term "click" or "click on" is used, it means that you should move the mouse pointer until the tip is resting on the object referred to in the text and then press the left mouse button. The term "drag" means to move the mouse pointer until the tip is resting on the object referred to in the text and then press the left mouse button and hold it while moving the mouse pointer; the slider you've "grabbed" will move as you move the mouse pointer. Release the button when the slider is in the spot you want.

Project Menu

New: Pulling down this menu item clears the Amiga's memory of any images currently in Digi-View Gold, which prepares you to start digitizing a new image. CAUTION: If you haven't saved the image on the screen before you use New, the image will be lost.

Load: Pull down this menu item to bring in IFF (Interchange File Format) images that you've stored on a disk. (IFF files are a standard format on Amiga graphics programs like DeluxePaint or Aegis Images. Any IFF image can be brought into Digi-View Gold). When you activate this item, the Load Requester will appear. The requester says "Enter Filename" at the top, and then there is a black space with "Name:" in grey text. Move the pointer so it is within the black space (the "window") and click the left mouse button. Use the Backspace key or the Delete key to remove the word "Name." The arrow keys will move the cursor inside the window if there are letters in the window. Type in the device number of the disk where the file is and then the filename. If the disk is in the internal drive, and the file is called "Mary," type in dfl:Mary, then move the pointer to the OK button and press the left mouse button (or hit the Return key when you've finished typing in the name). The file will be loaded into Digi-View Gold. If the external disk drive use the prefix dfl (the external drive on the Amiga 2000 is called dfl2); if you have a hard disk, the prefix is dhl.

Digitize Controls

- New
- Load
- Save
- Save RGB
- Load Palette
- Print
- Histogram
- About..
- Quit

Save: This menu item allows you to save digitized images as an IFF file that can be read by other IFF-compatible programs like Digi-Paint. The same requester that you saw in Load IFF appears. Follow the same procedure to type in the drive where you want the image to be saved, and the name you want to use for the file. The name cannot be longer than the window. It helps to use names that are easily remembered. **Note:** When saving a picture, make sure that what you see on the screen is what you want to go onto the disk; the "Save" option saves whatever is displayed on the screen. If you have been experimenting with the color controls, use "Display" to get the most current picture.

Save RGB: Lo-Res RGB files are 192K in size, where 32 color IFF files are only 40K. If you think that you'll want to re-adjust your image at a later date, save the image as an RGB file. You may want to save the image twice: once as an RGB file and once as an IFF file for use in other programs.

Load Palette: This menu item loads the palette associated with an image. As you'll see later in the Controls menu, you can display your digitized image in 32 colors or less. For instance, Electronic Arts' DeluxeVideo program uses only 8 color images, so you would want your digitized image to be displayed in 8 colors. Once you've constructed that particular 8 color palette, you can use the identical palette by activating Load Palette.

Print: If you want to print your Digi-View Gold screen image, use this menu item. You will need to unplug the Digi-View Gold module from the Amiga's parallel port to plug in your printer. **CAUTION:** make sure that the power is OFF before unplugging Digi-View Gold. In order to print from Digi-View Gold, save your image to disk, quit Digi-View Gold, and turn off your Amiga. Unplug the Digi-View Gold module and plug in your printer cable. Turn on the printer and then turn on your Amiga. Load Digi-View Gold and call up the image you want to print, then activate the Print function. Make sure you've set your Preferences on the Workbench disk to the correct printer.

Histogram: The vertical axis represents the number of pixels, and the horizontal represents brightness (left to right is darkest to lightest). Typically used with a video processor in conjunction with Digi-View Gold to adjust the signal. Properly used, the histogram can tell you if you have enough light in the picture; the graph should cover 70% or more of baseline on the raw data side in a well-lit picture. Adjusted histogram shows what Digi-View Gold is doing to try to correct for that particular color.

Quit: Pull down this menu item to exit Digi-View Gold and return to the Workbench. If you haven't saved the image on the screen, this image will be lost when you Quit Digi-View Gold.

Digitize

Red: Pulling down this menu item digitizes the red component of the video image. Make sure the red filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key (immediately right of the space bar) and the "r" key simultaneously.

Green: Pulling down this menu item digitizes the green component of the video image. Make sure the green filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key and the "g" key simultaneously.

Blue: Pulling down this menu item digitizes the blue component of the video image. Make sure the blue filter is in front of the camera lens before you activate this item. The keyboard equivalent is to press the right Amiga key and the "b" key simultaneously.

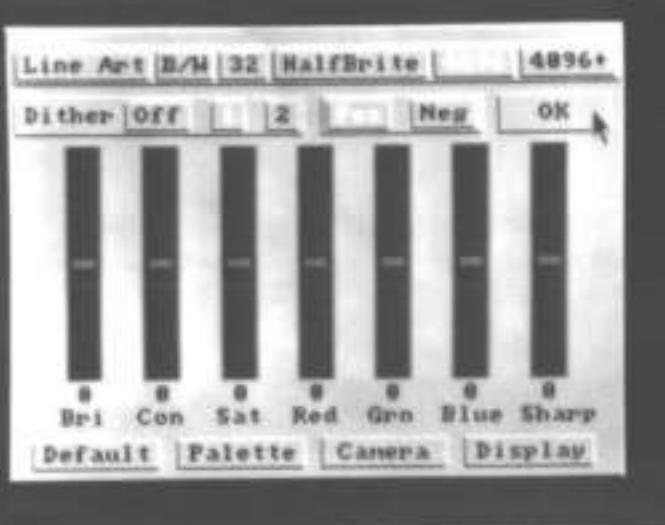
Black and White: If you want to digitize an image in Black and White or Line Art mode use the clear or green filter and turn off the color from the Digi-View 3.0 title screen.

For Digi-Droid Owners: Selecting the "Auto" menu option lets you use your Digi-Droid to digitize all three colors one after another without any further menu selections. The keyboard equivalent is to press the right Amiga key and the "a" key simultaneously.

Controls

Color: Activating this menu item brings up the color control panel. This may also be done from the keyboard by pressing the right Amiga key and the "c" key simultaneously. The Mode portion of the control panel determines how the digitized image will appear. When you first bring up the control panel, "4096" is highlighted. This means that when you digitize an image and hit the display button in this control panel, the image will appear using all 4096 colors of the Amiga's palette. This display mode is known as Hold-And-Modify (HAM).

The digitized image can also be displayed in 64 colors (labeled Halfbyte because the extra 32 colors are always half as bright as the first 32; see the Palette menu); black & white (labeled B/W); 32 colors (or less; see the Palette menu); or 4096+ (also called Enhanced Hold-And-Modify), which uses special techniques to display higher resolution and more color detail. Because 4096 mode is faster, use it to get all of your control settings just the way you want them, then display the image in the much sharper 4096+ mode for the best possible results. There is also a special display mode called Line Art which is for use in capturing high-contrast black and white artwork without any intermediate shades of gray. Brightness, Contrast and Sharpness are the only controls that work in this mode with typical values being 10 to 20, -5 to 5, and 0 to 5 respectively.



Just below the Mode panel is the Dither control. Setting the Dither to "1" or "2" will instruct Digi-View Gold to mix pixels of different colors to produce intermediate shades. Try viewing an image with Dither on, and then turn Dither off and hit Display again. The difference should be readily apparent.

Dithering—Dithering is the process of mixing colors to produce a new apparent color. There are 3 ways to dither in Digi-View 3.0: Dither 1 and 2, and sharpness. You can use dither along with sharpness, with the best result being a combination of the two. Typical values for sharpness might be 3–5. The Dither control gives a pebbly texture, with Dither 1 being less extreme and more subtle, and Dither 2 being more obvious and better for 8 or less colors. Digi-View Gold keeps track of over 2 million colors internally, but Amiga can only display 4096; dithering helps to fill in intermediate colors. Typical pictures will contain tens of thousands of subjective shades.

The panel directly right of the Dither control has two buttons, Pos and Neg. The Pos button creates a normal digitized image. Activating the Neg button and then choosing display will create a negative version of the image, inverting all of the colors. This option is useful for digitizing photo-negatives which can be turned back into positives.

There are seven sliders on the panel that control Brightness, Contrast, Saturation, Red, Green, Blue and Sharpness. These sliders adjust your digitized image for a better picture or just for special effects. To move the sliders, move the pointer onto one of the sliders and hold down the left mouse button. Drag the slider to the position you want and release the button. You'll notice that the number at the bottom of the slider changes from -48 to 48. You can record these settings for future reference.

The best way to learn to use the controls is to experiment with their effects on an image.

Brightness: Like its namesake on a TV, this control increases the overall illumination of the image. Moving the brightness control even a little has marked effects on the image.

Contrast: Again, this control is similar to the control on your TV set. Raising the control makes whites white, blacks blacker and colors more intense. Lowering it makes blacks and whites more gray and colors washed out.

Saturation: This works like the color control on a TV set. At minimum, the image is converted to black and white. At maximum, the colors are abnormally intense and cartoon-like.

Red: When set high, this increases the amount of red in the image; when reduced, the amount of red is diminished. At minimum, there is no red in the picture; at maximum, the picture is entirely in shades of red.

Green: When set high, this increases the amount of green in the image; when reduced, the amount of green is diminished. At minimum, there is no green in the picture; at maximum, the picture is entirely in shades of green.

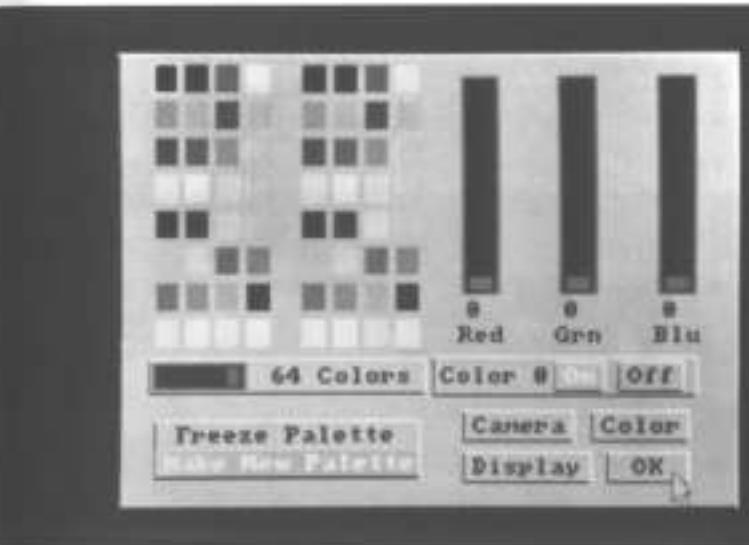
Blue: When set high, this increases the amount of blue in the image; when reduced, the amount of blue is diminished. At minimum, there is no blue in the picture; at maximum, the picture is entirely in shades of blue.

Sharpness: Raising this control will sharpen the image but increase the amount of "grain" or "snow." Lowering the control will reduce graininess but will increase the amount of "contouring" or "banding."

Default: Clicking on this button returns all the sliders to the neutral setting.

OK: This removes the control panel, but does not re-display the picture at any new settings.

Display: When you've adjusted the control panel to your liking, this control will display the picture with the new settings.



Palette

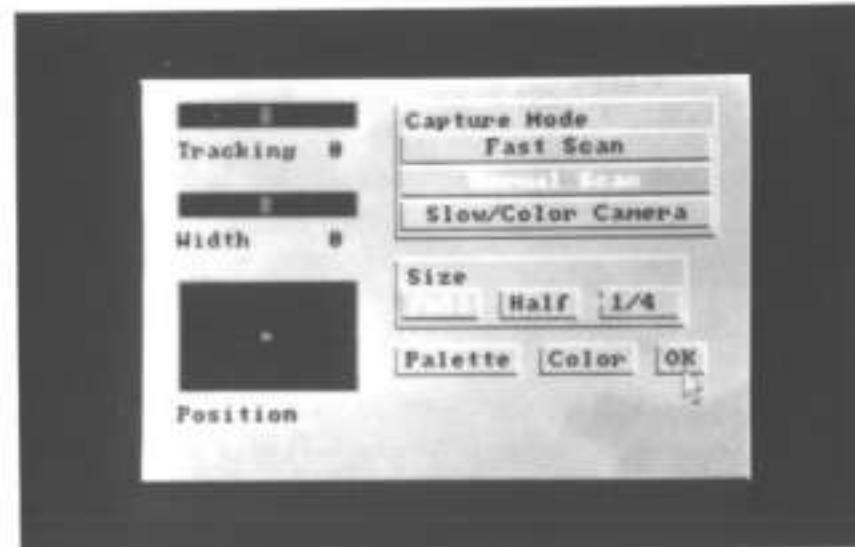
This menu item activates the Palette control. The palette shows the best 32 colors for displaying the image out of the 4096 possible. If you want to have less than a 32 color image, move the slider in the box labeled "Use 32 colors." You'll see the number of colors change as you move the slider. You'll also see a U-shaped outline move on the colored squares immediately above, showing the last color in the range you've selected. Hit the Display button and exit the Palette control. If the Color control was still set to 4096 or 4096+ colors, call up the color control and hit the 32 color button (which, you'll note, has changed to reflect the new number of colors you're asking for). The image will now be displayed with the new number of colors.

Why would you want to have less than 32 colors? Well, this can be quite useful if you want to bring an IFF image into a paint program and have some colors left over to alter the image. You may only want to use 28 colors in the image, thereby reserving four colors for you to add to the image in the paint program. In Electronic Arts' DeluxeVideo program, images can contain only 8 colors, so remapping an image to 8 colors is necessary for file compatibility.

Load Palette: Using Load palette on any picture loads in that picture's palette only. You can then use Freeze Palette in the Palette menu, then digitize in 32 colors, and Digi-View Gold will construct the picture in the loaded palette. Less storage is used for fewer colors—8 colors requires only three-bit planes instead of five.

You can also alter the individual colors in the palette to create interesting special effects. Point at the color you want to change and press the left mouse button. The colored square is now highlighted. If you move one of the Red, Green or Blue sliders to the right, you'll see the color change. When you've adjusted the colors to your liking, click on the Freeze Palette button, and then hit Display. The image will be redisplayed using the palette colors you've chosen. If you turn off the Dither control in the Color Controls, you can get some very interesting effects.

Halfbright: if you select halfbright from the color control menu you will see an additional 32 color palette next to the original 32 (see photo). These additional colors are exactly half as bright as the first 32 palette colors and can only be altered by changing one of the colors in the original 32 color palette. For example: to change the color in row 1, column 3 of palette 2, you must change the color in row 1, column 3 of palette 1. Halfbright mode always has exactly 64 colors and can not be made to have any less by re-sizing the palette. NOTE TO AMIGA 1000 OWNERS: Not all Amiga 1000's are capable of displaying graphics in the Extra-Halfbright mode. If the colors in the second palette are exactly the same as those in the first, then you have an Amiga that is not capable of Halfbright display.



Camera

This menu controls the various camera settings. This menu has no effect after you've already digitized a picture; it's used to adjust the camera before digitizing.

Scan Time: The three boxes at the top right of the Camera Control are the different scan times you can use with Digi-View: fast, normal and slow. Use the fast scan mode for a quick test scan of the subject. This is especially useful when you have a live subject that you think might fidget during a longer scan. And the picture quality is really quite good with a short scan. The normal scan is useful for every-day digitizing, especially with a static subject. For best results, use the slow scan. If you're using a color video camera, you should use this setting every time. Consumer color video cameras have less resolution than black and white cameras, so you should use the long scan time so that Digi-View Gold can do its best job on the image. The slow scan takes an average of four video samples of each image in order to eliminate random noise and give you a cleaner image.

Picture Size: The Full, Half, and $\frac{1}{4}$ buttons directly below the scan time buttons give you the option of creating your image in different sizes. The Full button is the normal picture size; the Half button gives you an image with one-fourth the dimensions of the normal image. If you already have an image on the screen from a previous digitizing effort, use the New command in the Project menu to clear the screen before creating a smaller than normal size picture.

Tracking: This control, at the upper left of the Camera Control, is used to synchronize the camera signal with Digi-View Gold. If you get a vertical stripe of jaggies approximately 1 inch wide on your screen, use the Tracking slider to eliminate it. Adjust the slider until the stripe has moved off the screen.

Width: This slider adjusts the width of the picture that results when you digitize. This is useful for slight adjustments to get a picture to fit a certain size. Large movements of this control will give you interesting special effects.

OK: When you've set the Camera Controls the way you like, click on the OK button to return to Digi-View Gold.

For Digi-Droid owners: The *Motor Cal* menu item brings up the screen for calibrating the Digi-Droid's motor as detailed in the Droid's instruction sheet.

Tutorial

Experience is an important factor in getting high quality digitized images. In other words, the best way to learn Digi-View Gold is by doing, so this tutorial will take you through digitizing and adjusting a picture. First, we'll go through the digitizing process, then we'll explore each of the various controls available in Digi-View Gold, starting with the Camera controls, then the Color controls and finally the Palette controls. Finally, we'll review Digi-View Gold's input and output capabilities. For purposes of this Tutorial, we'll assume you have a basic Amiga system, a Panasonic WV-1410 camera, and our CS-1 copy stand (other configurations should be similar enough for the purposes of this Tutorial). If you have any trouble at any part during this Tutorial, you may want to refer to Appendix B to troubleshoot the problem.

Digitizing

First, let's look at the Test Image #1 on your Digi-View Gold disk. This will be the object of your tutorial—to get an image as close as possible to this sample. Make sure your hardware and software are installed as described in the Getting Started section. Start your Amiga and your Digi-View Gold software as described in the Software Installation procedure. When you get to the opening Digi-View 3.0 screen, use the default settings and click in the "Ok" box, and Digi-View Gold will come up on your screen in a few seconds. If your video camera is not turned on and the cable plugged into your Digi-View Gold unit, you'll see a requester that says "No Video Signal Present." Click "Cancel" and you'll see a blank screen; if you press the right mouse button, the Digi-View Gold menus should appear at the top of the screen. If you do get this requester, make sure your Digi-View Gold is properly plugged in, the camera is plugged into the Digi-View Gold and turned on, and the lens cap is off.

Pull down Load from the Project menu. The Load Requester will appear, showing all of the files on the Digi-View Gold disk; the bar to the right of the file names may be moved by clicking on it and dragging it to reveal more names. Click on the file named "Test Image #1."¹¹ The file name will appear in the file window. Click on Load and the file will appear onscreen in a few moments. This is the "target" for our tutorial; by the time we're finished, you'll have an image that looks just like that on the screen.

Take the Digi-View Gold box and place it sideways in front of your video camera. (We'll use this box as our test subjects as we go through the various controls that Digi-View Gold offers.) Plug the video cable from the camera into your monitor (or whatever set-up you're using to view the picture) so that you can see the live video output from the camera. (See the directions under Monitor Set-up for viewing the image on your Amiga monitor.) If you're using our CS-1 copy stand and Panasonic WV1410 camera, adjust the copy stand so that the camera is about 18" from the Digi-View Gold box. Orient the box so that the title on the front of the box is on the left-hand side of your monitor, the box just barely fills the entire picture top and bottom, and you can see the NewTek logo on the right-hand edge of your screen (this means that the top of the box is missing on the left-hand side of the screen). We've filled the entire screen with the box so that we don't get any of the background in the picture.

Now adjust the camera focus so that the letters are clear and sharp. If you are using the Panasonic WV1410 camera, you may need to adjust the Mech Focus screw on the back of the camera to bring the image into focus. Once the focus is correct, it's time to check the lighting. Is the picture very dark or have dim areas? Are there any bright spots? If so, you need to adjust the lighting. Move your lights back and forth and tilt them at different angles, observing the effects on the picture. You'll see the bright and dark spots move as you adjust the lights. Adjust the lights so that there are no bright "washed out" spots in the picture, and the dark areas are eliminated (or kept to the very corners of the image). See the section on Using Digi-View Gold for more information about lighting.

You should now have the Digi-View Gold box properly framed, focused, and lit. If you're satisfied that is the case, take the video cable that comes from the camera and unplug it from your monitor and into the Digi-View Gold unit. Switch the monitor back to your computer's output (the Digi-View Gold screen), where you should see your mouse pointer. Now let's digitize the image. Position the red filter in front of the camera lens (make sure that only red is in front of the lens). Now pull down Red from the Digitize menu and watch as the red component of the picture is digitized. Be careful not to move the Digi-View Gold box or the camera during

this process. You'll notice that the mouse pointer becomes a "WAIT" sign while digitizing is going on. When the pointer reappears, you're ready to digitize the green component of the picture. Move the green filter in front of the camera lens and select Green from the Digitize menu. When that's finished, put the blue filter in front of the lens and select Blue from the Digitize menu. Finally, when the blue component is digitized, select Display from the Controls menu, and the full 4096 color picture will be displayed on the screen. (NOTE: if you have a Digi-Droid installed, instead of the above procedure simply pull down Auto from the Digitize menu, and the picture will be automatically digitized and displayed.) The image you have at this point may need some adjustment. If you're using a color camera, the image may look somewhat jaggy. See the Camera Adjustments section below for better results.

Camera Adjustments

Go to the Controls menu and pull down Camera. The Camera controls will appear. These settings affect the position and size of the video image received from the camera, as well as the time it takes to scan an image. If you're using a color camera, select the slow scan and redigitize the image. You'll see a marked improvement in the image quality. If you have some wavy lines in the image, use the Tracking and/or Width control to eliminate them. Digitize Red (no need to digitize all colors just to adjust the Tracking control), repeating until you have moved the wavy lines off of the image.

The width control will stretch out or compress the image; moving the control to the right stretches the image, moving it to the left compresses it. The Position control moves the image area on the screen. Experiment with these controls to center the image of the Digi-View Gold box on the screen.

Using the Color Controls

These controls are the heart of Digi-View Gold, giving you the power to manipulate the image in a variety of ways. First of all, we'll use the controls to get a sharp image with colors true to the original; then we'll try some of the special effects possible.

Pull down Color from the Control menu and the color controls will appear. You'll notice that along the top are 6 buttons: Line Art, B/W (black & white), 32 (for any number of colors from 2 to 32; see the Palette Controls), Halfbright (for 64 color display), 4096 (standard number of colors in HAM mode), and 4096+ (NewTek's Enhanced HAM mode; see Appendix A for a further explanation). The 4096+ button is highlighted as the default setting. Click on 4096, then click Display. The cursor will say "WAIT," and then you'll notice a line running down the screen. Watch particularly the left hand edge where the letters are; you can see them becoming fuzzier as the line passes down the screen. Now call up the Color controls again. When adjusting these controls, it's a good idea to do all of your adjustments while in "4096+" mode, since Digi-View Gold reprocesses the information faster this way. When you've got the colors where you want them, switch to "4096+" and re-display for the best results.

For this tutorial, the most important controls are the seven sliders that take up most of the color controls: Brightness, Contrast, Saturation, Red, Green, Blue and Sharpness. The red, green and blue sliders will adjust the hue of the image. Try each one of these sliders individually to see their effect, by setting the slider to plus or minus 10 and then clicking Display. You'll note that while most of those adjustments make the colors of the image move further away from the

colors of the Digi-View Gold box, there is one that gets you closer. Set that slider and then adjust the other two color sliders, one at a time, to see if you get any closer to the Digi-View Gold box colors. This trial-and-error process will get you the most exact color, and you'll also begin to develop your eye for colors and what adjustments give you the desired results.

If the colors don't look bright enough, try boosting the saturation control, which will give you more intense shades of colors on screen. The sharpness control, when raised slightly, will make the letters on the image appear more crisp. If, on the other hand, you want a smoother appearance to the image, you would lower the sharpness control.

Using the Palette Controls

The Palette controls allows you to match the colors used in an image to a pre-existing picture. When you're working with other Amiga programs that use 32 or fewer colors, you may want to digitize a series of pictures in the same palette. Or perhaps you want to use fewer colors in a picture than 32, to allow for some "extra" colors for titles. Or you may want to take up much less space on disk by saving an image in only 16 colors instead of 4096. The palette controls allow all of these options.

For the purpose of this tutorial, we'll remap the image we've digitized into 16 colors. Leave the settings in the color controls where they were at the end of the last tutorial. Click on "32" in the Mode section of the color controls, then click on "Palette" at the bottom of the color controls. This takes you to the Palette controls (you can also bring up the Palette controls using the Controls menu). You'll see a slider at the lower left of your screen that says "32 colors"; as you move it, notice that the number of colors changes to the right, and above a marker moves on the palette. Move the slider to "16." The default setting is "Making New Palette", so Digi-View Gold will construct the best palette it can to represent the image in only 16 colors. If you choose "Freeze Palette", Digi-View Gold will use the palette shown to create the image. Click on "display", and in a moment you'll see the image displayed in 16 colors. You'll notice that Digi-View Gold uses a technique called "dithering" (mixing pixels of different colors) to produce the impression of more than 16 colors.

Input and Output

Now that you have a final image, it's time to save the image on a disk so that you can use it again. Go to the Project menu and pull down Save. A requester will appear that shows you the files on the internal disk drive of your Amiga (called **df0:**). At this point, you can save your files on your Digi-View Gold disk, or on a separate data disk. Put your data disk in your second disk drive and click on the square labeled **df1:**. Click in the File window and a cursor will appear. Type the name you want to use for the file and then click Save. The picture will be saved under the name you've given. Later on, you can recall that image in another program such as Digi-Paint. See the Menus section for more information about saving different file types.

Using Digi-View Gold

Tips on Digitizing

Lighting: The best lighting set-up for digitizing with Digi-View Gold is fluorescent light on the CS-1L copy stand. There are several varieties of fluorescent lights that will plug directly into the light sockets on the CS-1L, and should be available at your local hardware store. When digitizing 3-D objects, you will sometimes need more light. If you use too much however, you may get distorted colors or see blue or yellow patches in the image. If you don't use enough light your image may turn out grainy. Always position your lighting to reduce the effects of glare on your image.

Motion: It is very important that both the camera and the object remain motionless during the digitizing process. Wavy lines or an out-of-focus look are a sure sign that something has moved. Make sure that the camera is fastened securely to its tripod or copy stand and be careful not to bump the camera when turning the filter wheel. The use of Digi-Droid greatly reduces the chances of motion affecting your image. NOTE: you can check to see if your digitizing set-up is moving during the digitizing process by half-way filling a glass with water and setting it where your subject usually rests. Watch carefully for any ripples caused by people walking by, etc.

Grain: Some cameras produce grainier pictures than others. Lowering the Sharpness control will reduce the grain. This is also useful in the 4096 color mode to reduce the "confetti." When using the 32 color mode, however, it's usually a good idea to RAISE the Sharpness control. Try setting it at about 36. This increases the dithering and smooths out the bands of color that sometimes appear in images with 32 or fewer colors. Low light conditions can also give your image a grainy look. In this case use the Slow Scan mode for better results.

Fewer than 32 colors: If you are digitizing a picture into 32 colors or less, try to have a background behind the subject that has as few colors as possible. This ensures that Digi-View Gold will use the best colors for the subject of the picture, and not "use up" too many colors in the duplication of a background. For instance, unless you really want a picture frame as part of your digitized picture, take the snapshot out of the frame before digitizing or adjust the camera so the frame is not in the image.

Random Sync: Some inexpensive black & white security cameras may produce what is called "random sync" or "random interlace." You can't really tell by looking at a live monitor whether you're getting 2:1 interlace or random sync. Unfortunately, Digi-View Gold and random sync just don't get along. Digi-View Gold will go ahead and digitize random sync video, but the result will exhibit a wavy or jagged quality throughout the entire picture, most apparent in horizontal lines or edges.

If you're in doubt about your camera's sync, plug it in and digitize a picture. If you get "the jaggies", it's probably random sync. Don't give up hope, though. Some cameras, such as the Panasonic WV-1410 have a switch inside to change from random sync to 2:1 interlace.

A problem related to the random sync jaggies can occur when a camera does have 2:1 interlace but does not meet the RS-170 standards. Using such a camera, you may get a narrow vertical stripe of jaggies in an otherwise normal picture. Use the Tracking control to correct this (as described in the Menus section).

Special Effects

You can get some very interesting effects with Digi-View Gold by disregarding the advice about how to get the best picture. Play with the Color Control settings. Moving some of the sliders to maximum creates strange special effects. For instance, moving the Contrast slider to the top in black & white mode gives you either pure black or pure white, with no gray. In 32 color mode, you'll get only 8 colors.

Experiment with other variations. Try using the wrong color filters, or filters of other colors than provided. Change the subject instead of the filter between shots. Move the camera or the subject during the scan. Instant modern art!

One interesting special effect was discovered by an enterprising user. 3-D pictures can be made by using the Red and Blue digitizing functions at slightly different camera angles. The resulting image is then viewed through standard 3-D glasses or by looking through the red and blue sections of the color filter. If you want to try 3-D pictures, here's the procedure:

Aim the camera at some three dimensional object. Remove the filter wheel or select the clear filter. Use Blue Digitize, move the camera three or four inches to the right (keeping it squarely aimed at the object), and select Red Digitize. Use the Color Control to raise the Red and Blue sliders to maximum. You may also have to lower the Brightness slightly. Select 4096 display. View the resulting image with the blue filter over your left eye and the red filter over your right eye.

Applications

Digi-View Gold is the perfect way to create "rough sketches" of artwork. If you're having trouble getting a starting point for a work of art, digitize an object and import it into your paint program. If you're making a piece of commercial art for a client, you may find it useful to digitize a package or a group of objects for an ad layout. Then with an appropriate paint program such as Digi-Paint (the 4096 color paint program from NewTek), you can add titles or other embellishments.

Animations for DeluxeVideo can be created by using Digi-View Gold to digitize several different views of an object and remapping the image into 8 colors. The color palette algorithms in Digi-View Gold are excellent—for example, try taking the King Tut image from DeluxePaint and remapping it into 8 colors for DeluxeVideo. You'll be amazed at the results.

Wonderful slide shows like NewTek's Demo Reel #1 can be created with Digi-View Gold images and appropriate graphics software like Digi-Paint, and soon to be released Digi-F/X.

Thank you for purchasing Digi-View! The Amiga offers the potential for a new world of applications of digitized pictures. We know you'll find many new uses for Digi-View Gold and we hope you'll take the time to write to us and let us know how you're using our products. Enjoy!

Troubleshooting Questions and Answers

I am using the Panasonic WV-1410 camera, but I still seem to get the random sync jaggies. The WV-1410 has a random sync/2:1 interlace switch which the factory presets to random sync. To make your WV-1410 2:1 interlace, simply remove the bottom cover (fastened with one screw at the front of the camera and one at the back) and flip the dip switch located on the left circuit board close to the video output jack from LL to INT. NOTE: ALWAYS UNPLUG YOUR CAMERA BEFORE OPENING IT.

I see a herringbone-type interference pattern in my digitized images. What causes this? The cause of this is usually a ground-loop. A ground-loop can occur when more than one of the components in your computer system are plugged into your house current with a grounded (three prong) plug. The computer is the only component that should be grounded; all other components, especially the camera, should be un-grounded by using a 3 to 2 prong adapter on their power cords.

My Digi-View Gold images become stretched as they are digitized from left to right across the screen. For example, a circular object ends up looking like an egg on its side. What's wrong? This is usually a sign of problems in your parallel port. Specifically, the problem is in the 8520 CIA chip that controls the port. This chip is socketed for easy removal and can be replaced by any authorized Amiga dealer for about \$20.00. NOTE: Your printer may function normally with a defective 8520, but a complex peripheral like Digi-View Gold will alert you to any problems right away.

Appendix A: Optional Equipment

NewTek sells several products that make digitizing with Digi-View Gold easier and more professional. For more information about these products and NewTek Demo Reels, NewTek Times and "The Cool Friends of NewTek Club" write us at: 115 W. Crane Street, Topeka, KS 66603 or for orders only call (800) 843-8934, 9-6 central time, Monday thru Friday.

Panasonic WV-1410 Camera: This camera features very high resolution, (better than 550 lines) a durable vidicon tube which resists burn-in, and a mechanical focus adjustment for a full range of macro focusing. Convenient mounting holes for the filter wheel bracket and our CS-1L copy stand make this camera the most complete solution for digitizing needs. Lens and all necessary cables included. **Our Price: \$279.95**

CS-1L Copy Stand: The best way to mount your camera for digitizing flat subjects (like photographs). Our CS-1L copy stand gives you 2 fully adjustable lights and vertical mount with adjustable brackets for your camera. Set-up is easy and adjustments are a snap. **Our Price: \$74.95**

Digi-Droid: Automate your Digi-View Gold system with Digi-Droid. This special computer controlled motor and filter wheel combination automatically drives your filter wheel while you capture the red, green and blue images. **Our Price: \$79.95**

Digi-Paint: The best-selling Amiga paint program—winner of the "Knock-Your-Socks-Off" award from AmigaWorld. It is the 4096 color all-at-once paint program! Break the 32 color barrier and use the entire Amiga palette on screen at one time. Special features include shading, tinting and blending, complete drawing tools and more. **Our Price: \$59.95**

One way to monitor the live video is with the Radio Shack (#15-1103) 1 X 3 Baseband Distribution Amp and the Amiga monitor. Plug the video camera into the input jack on the amp and plug the monitor and the Digi-View Gold into one output jack each. Then simply switch the monitor between composite (to view the live video) and RGB (to see the digitized image).

Appendix B: Installing Digi-View Gold on a Hard Drive

Installing Digi-View on your hard disk drive can be done in one of two ways:

- 1) From the Workbench screen open the Digi-View Gold disk icon and drag the icons from the Digi-View Gold window into any empty drawer in your hard disk.
- 2) From CLI copy the files from the Digi-View Gold disk to any empty drawer in the hard drive.

Appendix C: An Explanation of HAM Mode

The Hold-And-Modify (HAM) display mode on the Amiga uses six bit planes to display images. This means that each pixel (picture element—one dot on the screen) uses 6 bits to determine its color. If the first 2 bits are "00", the remaining 4 bits (giving a value of 0 to 15 in binary) are used to look up the pixel's color in the color table. This gives you 16 values from the possible 4096 colors available, which Digi-View Gold uses to choose the best 16 colors in the Color Palette to reduce the amount of "fringing." Each color has 4 bits worth of red, green and blue information; thus, each color has a Red value from 0 to 15, a Green value from 0 to 15 and a Blue value from 0 to 15.

If the first two bits of a given pixel are 01, the pixel has the same color as the pixel to its immediate left, except that the last four bits can be used to replace the red value of that pixel. If the first two bits are "10", the last four bits replace the green value, and if the first two bits are "11", the last four bits replace the blue value.

The effect of all this is that you can display all 4096 colors on the screen at once, though you can't go from black (red 0, green 0, blue 0) to white (red 15, green 15, blue 15) in one pixel; it takes three pixels to make that transition, since you can only modify one of the RGB values for each pixel. The transition would take four pixels on the screen. The first pixel is RGB 0-0-0; the second pixel is RGB 15-0-0; the third pixel is RGB 15-15-0; the fourth pixel is RGB 15-15-15 (white). **HOWEVER**, the ability of Digi-View Gold to use the 16 color Color Palette means that for 16 of the colors, that color can be immediately substituted anywhere on the screen without the transition just described. This technique is what gives Digi-View Gold its exceptionally sharp HAM images.

Appendix D: Disk Copying and Formatting

Remove the Workbench disk from your internal drive and put in a blank disk. The icon will appear on the Workbench labeled "DF0:BAD." Move the pointer to the disk labeled Digi-View Gold press the left mouse button, and drag the resulting disk down to the disk labeled DF0:BAD, and release the button. A requester will come up asking you to replace the Workbench disk in any drive. Push the button next to the internal drive to remove the disk, and insert your Workbench disk again. A requester will appear asking you to put Digi-View Gold in drive DF1:(the second drive, where the disk already is) and the destination disk (your blank disk) in DF0:. Remove the Workbench disk after the red disk drive light has stopped and put in the blank disk. Point to the Continue button on the requester and press the left mouse button. Your Digi-View Gold disk is now being copied. When the disk copy is finished, remove the copy and label it appropriately. You should always use the copy instead of your original disk to avoid any problems with damaged disks.

Appendix E: Specifications

Digi-View 3.0 Specifications

Screen Resolution:

NTSC:

Number of Colors	Screen Resolution in Pixels
2-32, 64, 4096	(320 or 352 or 384) × (200 or 240) (320 or 352 or 384) × (400 or 480)
2-16	(640 or 704 or 768) × (200 or 240) (640 or 704 or 768) × (400 or 480)

Note on memory requirements: Hi-Res, overscan modes require up to 2 megabytes of memory

Digitizing:

21 bits per pixel (2.1 million colors) resolution

File Format:

Read and write NewTek IP files

Read and write IFF files

Image Processing Used in Digi-View Gold:

Enhanced HAM Mode (high quality 4096 colors)

Control red, green, blue, contrast, brightness, saturation and sharpness

Infinitely Adjustable Hi-Pass and Low-Pass Spatial Filtering (Convolution)

Automatic Histogram Slide and Stretch

Automatic Color Temperature Compensation

Adaptive Palette Selection

Edge-detection

Convert images between resolutions

Interstitial Line and Pixel Synthesis
and/or Pixel and Line Averaging

Digitize to specific palettes

Dither control

Positive or negative images

Control number of colors in image

Appendix F: RGB and IP Files

The heart of Digi-View Gold is a precision analog to digital converter. Instead of the high speed 4-bit flash converters found in many video digitizers, Digi-View Gold uses a slower more accurate successive-approximation type converter along with a low-noise sample-and-hold amplifier. The result is an extremely faithful conversion of the original analog video signal into an array of 7 bit samples. All 7 bits are stored in ram throughout the manipulation process. In color, each pixel is 7 bits per primary color, or 21 bits, or over 2 million shades. This extra accuracy is necessary for processing the image for display, for example to enhance contrast, sharpness or color. This information is available for use outside the Digi-View software via the RGBIFF or IP files. RGBIFF files are similar to standard IFF ILBM files. An extra chunk, called DGVW, contains the control panel settings at the time the image was saved. Note that the settings have *no effect* on the data stored in the body of the file. These numbers are always the exact samples as received from the digitizer. If you examine the file header, you will notice that the image depth is specified as 21 planes. All 21 planes of each scan line are stored together before proceeding to the next lower line. The order of the planes is as follows:

Red	bit 6
Green	bit 5
Blue	bit 4
Red	bit 3
Green	bit 2
Blue	bit 1
*	
*	
*	
Red	bit 0
Blue	bit 0
Green	bit 0

Standard ByteRun1 run encoding is used to compress the RGBIFF files. See "EA.IFF 85 Standard for Interchange Format Files" available from Commodore-Amiga. IP files use a simplified file structure for those who want to manipulate the picture data without the overhead of decompressing and converting bitplane to byte-per-pixel format. To save an image in the IP format, press function keys F1 or F2. F1 saves only the red array, for monochrome. F2 saves all three arrays in the following order: Red, Green, Blue. Format is byte-per-pixel starting with the upper left corner and going to the right. In the case of 320×200 images, the first 320 bytes in the file represent the Red component of the top line of the image. The second 320 bytes represents the Red component of the second line of the image. The first 64,000 bytes contains the entire Red array. Byte 64,001 would be the Green component of the upper left pixel, and so on. Note: the LSB of each byte is zero. IP files can get rather large. A 640×400 IP file requires 768K or almost one entire disk. Hi-Res overscan files can be too large to even fit on one disk!